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The following comments are submitted as a request to U.S. Secretary of Energy Spencer Abraham that he recommend to President George W. Bush that the proposal to build a deep-geologic radioactive waste repository at Yucca Mountain NV be abandoned.

Quite early in my twenty-seven-year career of studying and opposing nuclear power, I remember first reading about the need to isolate radioactive wastes for millions and even billions of years. I could not believe that technical experts were actually expending time on elaborate charts and graphs, attempting to make predictions far beyond the imaginable future. I wondered if the generators of the data and writers of the texts actually believed what they were writing or if they were just doing their jobs.

Two recent DOE documents are similarly incredible: the Yucca Mountain Preliminary Site Suitability Evaluation (DOE/RW-0540, July 2001; referred to herein as PSSE), and the Yucca Mountain Science and Engineering Report (DOE/RW-0539, May 2001; referred to as S&ER). Detailed predictions are included that extend 10,000 years from now, and beyond. Here in Missouri we lost track of manmade dioxin in less than a decade. And as my Mom might have explained to me in my youth: dioxin, compared to radioactive waste, is just goofer feathers.

I find it hard to understand how today's scientists and engineers would attempt to predict and analyze scenarios of the Yucca Mountain area's future --- its seismic and volcanic activity, its wetness and changes in climate as affected by global warming, its demography. For hundreds of thousands of years and beyond, or even "just" for the 10,000-year regulatory compliance period.

Although the DOE admits that inherent, "residual" uncertainties exist regarding Yucca Mountain, it nevertheless makes pronouncements about risk and the chances of failure, minimizing it all, as if the future were predictable, and as if today's increasingly vulnerable national government can somehow mandate leak-proofness into the requisite eternity.

The Callaway nuclear power plant here in Missouri, which was ordered in July 1973, was one of the last four plants ordered in the United States. All nuclear power plants ordered after October 1973 were canceled. In fact, plant cancellations had already begun in 1972, not because nuclear power is dangerous and dirty, which it is, but because it is expensive.

America's apparent solution to the nuclear waste problem is to ship the wastes from place to place. Many people call it a shell game; other describe it as shipping the problem around. As of the year 2002, the United States government and corporate leaders will have been generating long-lived, lethal radioactive waste for SIXTY YEARS, knowing that no safe technology and no safe

location exist. The Atomic Age began in 1942 when the world's first self-sustaining nuclear chain reaction (at the Fermi reactor in Chicago) demonstrated that man could control the atom. The atom, but not its wastes.

Who and when will some federal agency or even one powerful person dictate that: No more Radioactive waste shall be generated until, if ever, we figure out what, if anything, can be done to isolate the radioactive waste we have already created?

Now that terrorism has an undeniable presence in our American lives, it seems to me that the debate about nuclear power should be over. It is time for all nuclear power plants to be shut down as soon as possible; their stockpiles of irradiated fuel rods and other lethal radioactive wastes should be containerized (in fuel pools or dry storage casks), and emplaced in the most secure buildings at the nuclear plant site. The current, temporary ban against the shipment of radioactive waste should be extended indefinitely. To ship high-level radioactive waste by truck and train (and barge?) to Nevada, as proposed, through 43 states, would create easy targets for terrorists within large corridor communities and small ones.

Few stationery targets in the United States or the world would be more appealing to a terrorist and potentially more devastating than a nuclear power plant. And few mobile targets would be more appealing than the byproducts of a nuclear plant (irradiated reactor fuel rods) traveling through the heart of a major urban area. Concerns about terrorists and saboteurs are not new for the Nuclear Regulatory Commission, for the DOE, or for their licensees; nor have their concerns been kept secret. While the public posture of the NRC and DOE, prior to September 11, 2001, has been to belittle the probability and the risk of a terrorist attack on a nuclear facility or vehicle, these agencies have issued reports and regulations acknowledging the potential of such events for years.

For example, a recent Sandia National Laboratories' report, SAND99-0963, released in June 1999 and entitled "Projected Source Terms for Potential Sabotage Events Related to Spent Fuel Shipments," updates earlier studies --- and ends up with such non-reassuring pronouncements as: "The possible sabotage scenarios that are candidates for consideration in this document are limited only by the inventiveness of the human mind." (p. 27) and "The fact that HEIDD-1 and HEIDD-2 [high-energy density devices, potentially delivered by a rocket] will penetrate a single wall of a spent nuclear fuel cask should not be viewed as unusual because spent nuclear fuel casks are not designed to resist attack by HEIDDs. . . ." (p.47) The source term of an accident refers to the amounts of radioactive material released to the environment.

The Nuclear Regulatory Commission has long required that armed escorts accompany shipments of irradiated fuel through population centers. In the Code of Federal Regulations, Title 10, Part 73, this requirement is described as providing protection "against acts of radiological sabotage and to prevent the theft of special nuclear material."

The hard questions: In this era of international terrorism, the U.S. media are beginning to focus on the vulnerability of nuclear power plants and their stockpiled irradiated fuel rods. Some politicians are beginning to concur with the DOE's proposal under consideration --- to move the highly dangerous fuel rods away from their locations near major population centers (such as New York, Boston, Philadelphia, Chicago) and near smaller communities, out west to a more isolated location. But how many communities would be placed at risk if the fuel were to be placed in motion for the

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next two dozen years or more? And would the accumulated nuclear fuel, amassed in one location on a huge tarmac, not become a terrorist's ultimate dream?

No safe answer exists --- but perhaps it would be safer: (1) to abandon or at least postpone the proposed interim-storage parking lot at Yucca Mountain (for decades while the fuel cools down a bit and at least until the deep-geologic repository gets built); and (2) keep the irradiated fuel as secure as possible at the nuclear power plants where it was generated until, if ever, scientists and engineers can figure out how to neutralize it and make it safe for transport on our roads and rails, and through our communities and neighborhoods.

Nuclear power plants should be shut down and mothballed now. The buildings with the thickest walls, base mats, and roofs should be used for storing the irradiated fuel in casks or pools. If the nuclear industry believes that the buildings cannot be made secure enough to store the wastes, how can they justify continuing to house an operating reactor vessel filled with the equivalent long-lasting radioactivity of a thousand Hiroshima bombs? Nothing about radioactive waste is safe, but transporting it across America out to a missile-prone parking lot would certainly not make it safer.

In addition to the threat of terrorism and the resulting dispersal of radioactivity, many other uncertainties, risks, and unknowns exist. Conditions inherent in the design, fabrication and fissioning of the fuel rods makes their transport through communities highly unpredictable and dangerous. Radioactive noble gases and other fission gases accumulate in the irradiated fuel rods, causing an increase in internal pressure. This buildup continues during storage in the spent fuel pool and would continue during transport. In the event of a transport accident or attack, these gases could be released. In addition, volatile aerosol products (including cesium isotopes with their highly penetrating gamma rays) could escape.

While a more stringent EPA permissible radiation dose is mentioned in the PSSE --- that is, 15 millirem for a member of the public (from 40 CFR 197, Subpart B) --- I was surprised to read that the DOE has described the permissible Preclosure radiation dose from potential accidents as five rem (5,000 millirem). (S&ER Table 5-9 at page 5-23, and PSSE Table 2-9 at page 2-33). That 5,000 millirem exposure standard is unfortunately the permissible annual dose for a nuclear worker during his or her routine employment (as compared with a chest x-ray's twenty millirem), but when was it decided that a member of the public was to be allowed to receive that dose as the result of an "event" (accident) at Yucca Mountain during the Preclosure period? To how many "events" would a member of the public be allowed to be exposed?

I would like to add that I believe the whole concept of millirems and rems (and rads, sieverts and grays) is highly suspect. The levels of contamination in air and water permitted by the NRC and DOE today, both within nuclear facilities and in releases to the environment, are virtually the same as those established in the mid 1950s, and apparently were based on very few animal or virtually no human data. (We now know, of course, of plutonium experimentation on some lower-income human beings.) Appearing before the Joint Committee on Atomic Energy of the U.S. Congress in May 1960, W.B. Harris, Director of the Environmental Science Division of the AEC's Health and Safety Laboratory, testified as follows:

If one now refers to [National Bureau of Standards] Handbook No. 69, here can be seen a list of approximately 25 members for each of about 200 radionuclides. How is it possible that one can derive approximately 5,000 different permissible concentrations, cloak these

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values with legal stature when they have been generated on the basis of the relatively few human injuries which have been documented, is beyond comprehension. . . . It is true that considerable animal experiment has gone into the development of many of these data. However, one must only cautiously take the position that man as an animal is to be ignored. Human experience is surely the more valuable." (quoted by the late Leo Goodman in a paper in the Atomic Energy Law Journal, Winter 1963, p. 264)

Uncertainties in the performance assessment of the metals proposed for the Yucca Mountain repository are disturbing. Perhaps it is impressive that one of the nickel alloys that preceded Alloy 22, the most recent waste package material of choice, has maintained its mirror finish (has not noticeably corroded) "even after 56 years of exposure to a saltwater atmosphere. . . ." (S&ER, p. 4-187) But what is astonishing is that a metallurgist would be comfortable extrapolating information on the corrosion future of a nickel alloy thousands of years from now (or millions or billions of years) on the basis of the corrosion resistance observed after only six decades. Perhaps metallurgists don't embarrass as readily as housewives.

Speaking of metallurgists, has any of them predicted the cost and extractability of the titanium proposed for the fabrication of the drip shields designed to divert the liquid moisture that would drip from the drift (horizontal underground passage) walls? And while titanium has long been recognized to be relatively resistant to corrosion, has anyone extrapolated its durability for the millennia that will be required to keep the radioactive wastes isolated from the biosphere?

When will a United States agency or even one brave political leader blow the whistle on this Yucca Mountain charade, admit that the Empire has no close for these permanent poisons --- and demand that we STOP GENERATING MORE? **When?**

Sincerely,

Kay Drey